Sub a1

WHAT IS CLAIMED IS:

1. A process description apparatus for describing a process using a model wherein a plurality of activities have dependence relationships via a resource, the process description apparatus comprising:

means for storing a plurality of definitions of epistemological grounds for domains of the process to be described;

means for storing attributes of the activities of the process to be described for each of the epistemological grounds;

means for storing attributes of the resource of the processes to be described for each of the epistemological grounds;

means for storing attributes of the dependence relationships of the process to be described for each of the epistemological grounds; and

means for displaying the activities, the resource, and the dependence relationship as figure elements.

2. A process description apparatus for describing a process using a model wherein a plurality of activities have dependence relationships via a resource, the process description apparatus comprising:

means for specifying an epistemological ground for a domain of the process to be described;

means for storing attributes of the activities of the process to be described for each of the epistemological grounds;

means for storing attributes of the resource of the process to be described for each of the epistemological grounds;

means for storing attributes of the dependence relationship of the process to be described for each of the epistemological grounds; and

means for displaying at least one of the activities, the resource, and the dependence relationships as a figure element.

3. A process description apparatus for describing a process using a model wherein a plurality of activities have dependence relationships via a resource, the process description apparatus comprising:

means for storing constraints of the process activities, the resource, and the dependence relationships under a predetermined domain identifier for a domain of the process to be described;

means for assigning a domain identifier to the process to be described;

means for describing attributes of the activities of the process to be described under constraints of the assigned domain identifier;

means for describing attributes of the resource of the process to be described under constraints of the assigned domain

identifier;

means for describing attributes of the dependence relationships of the process to be described under constraints of the assigned domain identifier; and

means for displaying at least one of the activities, the resource, and the dependence relationships as a figure element.

4. The process description apparatus as claimed in claim 1 further including means for displaying the epistemological grounds as a figure element.

5. The process description apparatus as claimed in claim 4 wherein the figure element of the epistemological grounds surround the figure element of the activities and the figure element of the dependence relationship.

6. The process description apparatus as claimed in claim 1 further including:

means for storing classification structures of the epistemological grounds; and

means for displaying at least a part of the stored classification structures of the epistemological grounds.

7. The process description apparatus as claimed in claim 2 further including:

means for storing classification structures of the epistemological grounds; and

means for displaying at least a part of the stored classification structures of the epistemological grounds.

8. The process description apparatus as claimed in claim 3 further including:

means for storing classification structures of the epistemological grounds; and

means for displaying at least a part of the stored classification structures of the epistemological grounds.

9. The process description apparatus as claimed in claim 1 further including:

means for storing classification structures of the activities, the resource, and the dependence relationships; and

means for displaying at least a part of each of the stored classification structures of the activities, the resource, and the dependence relationships.

10. The process description apparatus as claimed in claim 2 further including:

means for storing classification structures of the activities, the resource, and the dependence relationship; and

means for displaying at least a part of each of the stored classification structures of the activities, the resource, and the dependence relationships.

11. The process description apparatus as claimed in claim 3 further including:

means for storing classification structures of the activities, the resource, and the dependence relationship; and

means for displaying at least a part of each of the stored classification structures of the activities, the resource, and the dependence relationships.

12. The process description apparatus as claimed in claim 1 wherein the epistemological grounds contain one epistemological ground set by default.

13. The process description apparatus as claimed in claim 2 wherein the epistemological grounds contain one epistemological ground set by default.

14. The process description apparatus as claimed in claim 3 wherein the epistemological grounds contain one epistemological ground set by default.

15. A process description method executed by a computer

for describing a process with activities, dependence relationships, a resource, and epistemological grounds as four components, the process description method comprising:

describing an target of the real world, to be described as the process, as a model in which a plurality of activities operate having dependence relationships via a resource; and

describing a course and purpose of a process description proper to a target domain in an epistemological ground as constraints in description of the three components of the activity, the resource, and the dependence relationshisp.

16. The process description method as claimed in claim 15, further comprising:

describing the dependence relationships based on the resource handled between the activities; and

classifying the dependence relationships into types according to six superordinate classes of resource distribution, resource binding, resource transfer, resource binding and distribution, resource transfer and distribution, and resource binding and transfer.

17. The process description method as claimed in claim 15, further comprising:

describing a coordination method of coordinating the dependence relationship between the activities as an attribute

of the dependence relationship.

18. The process description method as claimed in claim 15 wherein the activity is a component for describing the operation forming a process, the contents including an activity name, the resource involved in the activity, and the details of the activity are described, and the details of the activity are described as the process.

19. The process description method as claimed in claim 15, wherein the dependence relationship is component for describing the relationship between the activities, the contents including the dependence relationship between the activities when attention is focused on the resource transferred between the activities, and a coordination method of coordinating the dependence relationship are described, and the coordination method is also described as process.

20. The process description method as claimed in claim 17, wherein in the dependence relationship, if more than one coordination method exists, the contents including information concerning comparison of the coordination methods are described.

21. The process description method as claimed in claim

15 wherein the resource is a component for describing the resource transferred between the activities and the contents including a resource name and the nature of the resource are described.

22. The process description method as claimed in claim 9 wherein the epistemological ground is a component for describing the purpose and course of process description in a target domain in which the process to be described exists, and the contents including information concerning definition of the three components of activity, resource, and dependence relationship are described.

23. The process description method as claimed in claim 10 wherein the epistemological ground is a component for describing the purpose and course of process description in a target domain in which the process to be described exists, and the contents including information concerning definition of the three components of activity, resource, and dependence relationship are described.

24. The process description method as claimed in claim 11 wherein the epistemological ground is a component for describing the purpose and course of process description in a target domain in which the process to be described exists,

and the contents including information concerning definition of the three components of activity, resource, and dependence relationship are described.

25. The process description method as claimed in claim 15 wherein a single global epistemological ground independent of a domain exists and definition of the activity, the resource, and the dependence relationship as initial values independent of the domain is described as attributes of the global epistemological ground.

26. A process classification method executed by a computer for classifying processes described with activity, dependence relationship, resource, and epistemological ground as four components, the method comprising:

classifying the three components of the activity, the resource, and the dependence relationship according to various classification structures including meaningful abstract and concrete (Is-a) relationship, inclusion (Part-of) relationship indicating composition; and

managing cluster relationship proper to each field and the classification structures as attributes of the epistemological ground using each component.

27. A process classification method executed by a

computer for classifying processes described with activity, dependence relationship, resource, and epistemological ground as four components, the method comprising:

classifying the epistemological grounds according to various classification structures including meaningful abstract and concrete (Is-a) relationship, inclusion (Part-of) relationship indicating composition; and

managing cluster relationship proper to each field and the classification structures as attributes of a global epistemological ground.

28. A process classification method executed by a computer for classifying processes described with activity, dependence relationship, resource, and epistemological ground as four components, the method comprising:

classifying the four components of the activity, the dependence relationship, the resource, and the epistemological ground according to various classification structures including history information of creation histories, change histories, reference histories, and deletion histories; and

managing the classification structures as attributes of the epistemological ground using each component.

29. A process classification method executed by a computer for classifying processes described with activity,

dependence relationship, resource, and epistemological ground as four components, the method comprising:

classifying characteristic processes used in specific patterns, such as those frequently used or the well-worn means most frequently used under a specific condition, according to various classification structures including the cluster relationship; and

managing the classification structures as attributes of the epistemological ground using each components.

30. A process knowledge database apparatus for classifying and retaining process description data describing processes with activity, dependence relationship, resource, and epistemological ground as four components according to classification structures, the process knowledge database apparatus comprising:

input means for inputting the process description data;

retrieval means for retrieving the process description data;

edit means for editing the process description data;

database means for managing the process description data;

display means for displaying the process description data; and

storage means for storing the process description data.

31. A process retrieval method for retrieving a process using a process knowledge database apparatus comprising

input means for inputting the process description data; retrieval means for retrieving the process description data; edit means for editing the process description data; database means for managing the process description data; display means for displaying the process description data; and storage means for storing the process description data., the method comprising:

retrieving specific information, similar information, peripheral information, target information from the various classification structures with the types, values, or their combinations contained in the attribute information of the activity, the dependence relationship, the resource, and the epistemological ground as retrieval keys.

32. A process analysis method executed by a computer for analyzing a process with activity, dependence relationship, resource, and epistemological ground as four components, the process analysis method comprising:

inputting a definition of an epistemological ground for classifying the process;

analyzing and describing the process from the activity, dependence relationship, and resource of the process based on the defined epistemological ground; and

determining whether or not an end condition of description defined in the epistemological ground is satisfied,

repeating the inputting and analyzing steps until it is determined that the end condition is satisfied.

33. A process analysis method executed by a computer for analyzing a process with activity, dependence relationship, resource, and epistemological ground as four components, the method comprising:

describing the process, if the epistemological ground concerning a domain of the process to be analyzed already exists, while the epistemological ground is changed gradually based on the history of analysis conducted in the past using the epistemological ground, whereby the process analysis is advanced.

34. A process analysis method executed by a computer for analyzing a process with activity, dependence relationship, resource, and epistemological ground as four components, the method comprising:

editing the history of change of the epistemological ground made in the past as required, if the epistemological ground concerning the process to be analyzed already exists;

retaining gradual change of the epistemological ground in the epistemological ground history as methodology of process

analysis; and

analyzing and describing the process following the gradual change of the epistemological ground, whereby the process analysis is advanced.

35. A process design method executed by a computer for designing a new process by retrieving information of a similar process description to the whole or part of the process to be designed using a retrieval method as claimed in claim 31 and correcting or expanding a found process model.

36. A process display method for displaying a process described with activity, dependence relationship, resource, and epistemological ground as four components, the method comprising:

representing a background area including an expanded E-R model, characterized in that E (entity) and R (relationship) of an E-R model are related to activity and dependence relationship respectively and that a polynomial link of n to m is allowed in R, and a model represented by the expanded E-R model, in a background color or by area contour lines as the epistemological ground.

37. A classification structure display method comprising:

representing a background area including an expanded E-R model characterized in that E (entity) and R (relationship) of an E-R model are related to classification target and abstract-concrete (Is-a) relationship, inclusion (Part-of) relationship, or cluster relationship respectively and a classification structure represented by the expanded E-R model as an epistemological ground.